INDUSTRIAL CHEMISTRY.

On the Oxidation of Cellulose with special reference to the chemistry of Bleaching and Dyeing. C. F. Cross and E. J. Bevan.

A review of results obtained by the author as well as by G. Witz (Bull. Soc. Ind. Rouen[10] 5, 416 and [11] 2, 169), (Drug. Pol. Journ., **250**, 271), regarding the oxidation products of cellulose. Witz found that solution of bleaching powder and CO_2 had no apparent action upon cotton goods below 60°, but above that temperature the action was marked, the effects increasing with the temperature, until at 100° the cotton was resolved into a powder. Light assisted the action. The compound formed, which he called oxycellulose, contained about 1 per cent. more oxygen than cellulose. This compound has a strong affinity for certain coloring matters, principally those of a basic character. Methylamine blue dyes it readily, and was used as a test for its presence. For diphenylamine blue it has no affinity. The tests are best made in a 1,2000 cold solution of the former, in which the cotton is soaked for 20 minutes. If the cloth has been bleached the chlorine must be removed by a series of washings with diluted reagents, nitric acid, bisulphite of soda, hydrochloric acid, &c., the mode of using which is specified. The researches of M. Witz furnish a guide to bleachers to the best method of managing their goods so as to bleach, and at the same time avoid injuring the fibre. The oxycellulose, which can be produced at will, has a strong affinity for vanadium compounds, so great indeed that it will abstract the vanadium from a solution containing a million millionth part (1,000,000,000,000).

Patterns in oxycellulose can be made on the cloth, *i. e.*, the oxycellulose can be used as a mordant for many dyes. Caustic alkalies prevent the formation of this compound. Many hitherto unexplained phenomena in bleaching and dyeing have been made clear by the discovery of this compound. The jute cellulose, isolated and examined by the authors, seems to be identical with oxycellulose. Another oxydation product of cellulose recently obtained by use of an alkaline solution of potassium permanganate, is also briefly mentioned. It seems to be $C_{19} H_{18} O_{22}$, and closely resembles Fremy's metapectic acid. (*Jour. Soc. Chem. Ind.*, **3**, 206).

E. W.

Injury done to vegetation by Gases arising from certain manufacturing processes. S. Hamburger.

A table of the results of a series of examinations of leaves from different plants, most of which grew in the neighborhood of manufactories at St. Helens. From the amounts of ash of SO_3 and of Cl determined, no positive inferences could be drawn. Testing the aqueous extract of the plant with litmus paper, appeared also to be of no service. The SO_2 in gases from the combustion of coal, appeared really to be the principal cause of injury to vegetation. Angus Smith found in the air of London 730 grains SO_3 per million cubic feet and 1098 grains in that of Manchester. The author found 1260 grains in the air of St. Helens. Assuming a coal of average composition, containing 2 per cent. S, he calculates that fire gases contain 0.193 volume per cent. SO_2, and would have to be diluted with 64 times their volume to bring the proportion down to 0.003 volume per cent., the limit of safety according to Freytag. Fruit trees are most sensitive to these gases, forest trees are less so, and agricultural plants are still less. Soot is not damaging to plants.

Experiments were made by treating plants with the spray of dilute acids. Two thousandth normal solutions of H_2SO_4 and HCl. (0.0245 gm. H_2SO_4 or 0.01825 gm. HCl per litre), the strongest solutions tried, seemed to be without effect. Experiment showd that chlorophyll, under the influence of acids, sooner or later turned brown, depositing a brownish sediment. Leaves damaged by acid fumes showed brownish spots, but attacks of insects, fungi, &c., sometimes caused similar spots. (*Jour. Soc. Chem. Ind.*, **3**, 202.) E. W.

Further notes upon the solidification of Fatty Oils. W. L. Carpenter.

Description of the process of St. Cyr Radisson for the conversion of oleic acid into palmitic by means of the reaction observed by Varentrapp in 1841. It consists in heating the oleic acid with a large excess of caustic potash, the reaction being

$$C_{18}H_{34}O_2+2KHO=C_{16}H_{31}KO_2+C_2H_3KO_2+H_2.$$

The apparatus (termed a "cartouch") consists of a short, closed cylinder, with funnel-shaped base and provided with mechanical stirrer. A sectional view is given. It is charged with 1,500 kil.

oleic acid and 2,500 kil. potash lye (Sp. Gr. 1.4). Heat is applied, a hole in the cover being left open until steam ceases to escape, when it is closed, and the gases escaping are passed through a coke tower to a gas holder. The reaction begins at 290° C., and goes on at 300 to 310°. At 320° the odor of the gas changes, and steam must be at once injected to prevent destructive distillation. 36 to 40 hours are required to complete a charge. The progress of the reaction is judged of by the congealing point (Dalicau test) of the fatty acids obtained from small samples withdrawn from time to time. (*Jour. Soc. Chem. Ind.*, **3**, 200). E. W.

Note on the mannfacture of simple Cyanides and Prussiates by the aid of Trimethylamine; process of Ortlied and Muller. E. Willm.

The reaction indicated by Wurtz (Ann. de Chim. Phys. (**3**), **30**, 454), is used in this process. Commercial trimethylamine is vaporized and the vapors decomposed into hydrocyanic acid and ammonium cyanide by passing through red hot retorts. The vapors are first passed through dilute sulphuric acid, which takes up the ammonia, and then through solutions of potash soda, &c., to form the cyanides desired. The unabsorbed gas is used to illuminate the works. If prussiates are desired, cakes of ferrous oxide, prepared by precipitating ferrous chloride with milk of lime, and filtering by filter press, are introduced into the alkaline absorbers. The oxide dissolves as the cyanide forms. No unpleasant fumes whatever are produced in the process. (*Bul. Soc. Chim.*, **41**, 449.)

E. W.

On the effect of temperature in Dyeing. E. J. Mills and A. G. Rennie.

Experiments with purified cashmere wool and a 0.02 per cent. solution of rosaniline acetate showed that the maximum dyeing effect was produced at 31.1° C., the minima of effects being at —1.46° and +81.15°. Using the rosaniline salt in excess, the maximum deposition of color occurred at 39° C., the minima at about 0° and at 82°. With mauveine the maximum was at about 49° C., the minimum was calculated as —23.8° C., but on the other side was not reached at 85° C., though the diminution was quite marked. The conclusion is that where an aniline color is susceptible of dissociation there is a positive disadvantage in using high temperatures in the dye bath. (*Jour. Soc. Chem. Ind.*, **3**, 215.) E. W.

Standard methods of sampling and analyzing Commercial Products and of stating the results.

A conference on this subject in the Manchester Section.

The discussion was participated in by Messrs. I. Levinstein (chairman), Geo. E. Davis, Mellor, Watson, Smith, J. Carter Bell, Watson and Grimshaw.

Prof. Roscoe also had written a letter on the subject, which was read. There was on the part of most of the speakers a strong objection to fixing upon methods which must invariably be used by the analysts, but all agreed that more thorough and satisfactory methods of sampling should be used, and that analysts should not (as is frequently the case) be accused of inaccuracies for which they are really not responsible. The following resolution was passed : "That in the opinion of this meeting it would be practicable and very desirable to attain a national agreement on standard methods of sampling ores, raw products and chemicals, but that an international agreement would be at present impracticable." (*Jour. Soc. Chem. Ind.*, **3**, 210.) E. W.

On the existence of Manganese in Wines. E. J. MANUMENÉ.

In three wines of Lower Beaujolais (vintage of 1865, 1882 and 1883) the author found considerable proportions of manganese. It appeared to exist in the wine as double tartrate of potassium and manganese. The proportion of metallic manganese in the wine of 1865 (red), was found to be 5 to 7 mgs. per litre, corresponding to 51.73 mgs. of double tartrate. The soil upon which the grapes grow is known to contain much manganese. . Further investigation is proposed. (*Bul. Soc. Chim.*, **41**, 451.) E. W.